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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,839	12/17/2003	Sung-Hca Cho	1594.1273	4514

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EXAMINER	
WEINSTEIN, LEONARD J	
ART UNIT	**PAPER NUMBER**
3746	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/19/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/736,839	CHO ET AL.	
	Examiner	Art Unit	
	Leonard J. Weinstein	3746	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/17/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 26 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. A proper range is not given with the statement of "within a range of 4:1" with reference to a ratio between the displacement of a first and second compression chamber because only one reference/data point is given.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 11-21, 23, 26-28, and 31-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Ebara et al. 6,189,335. Ebara teaches all the limitations as substantially claimed including a rotary compressor comprising: a rotating shaft 6, first 51 and second 52 compression chambers in which a refrigerant compression stroke and an idle stroke are alternately performed in accordance with a first rotating direction of the rotating shaft (col. 11 ll. 51-53), one 23 or more 24 sub-paths to connect one or more predetermined points of respective one or ones, 9 and/or 10, of the first 51 and second compression 52 chambers to respective one or ones of a refrigerant intake side 32A and or 43 to control compression capacity of the first 51 and second 52 compression chambers, and a path control unit to control opening ratios of the one or more sub-paths (col. 2 ll. 32-55 and col. 3 ll. 17-22); a first 29 and second 19 exhaust port; predetermined points of the first and second compression chambers for communicating with the first 23 and second 24 intake ports; a first and second sub-path pipe and connectors with the areas between elements 23 and 24 and 9 and 10 respectively; first 245 and second 247 path control units which control the opening ratios of the first and second sub-paths; first 51 and second 52 compression chambers have different compression capacities and the second chamber compression capacity is less than that of the first; wherein a capacity ratio of the first and second compression chambers is in a range of 2.1:1 to 1.9:1 or about half (col. 8 ll. 27-34); and plural compression chambers to vary a refrigerant compression capacity thereof to set a total capacity of the rotary compressor between at least four stages based on a direction of a rotation of the rotating shaft and a connection status of each of the one or more sub-paths (col. 9 ll. 63-67). Further Ebara teaches a first 13 and second 14 roller piston fitting over the first 11 and second 12 eccentric part of the rotating shaft 17 in the first 51 and second 52 compression chamber, where first and second gaps are defined between first

and second roller pistons and eccentric parts, first and second cam bushes being eccentric in shape and fitting in first and second eccentric gaps between respective eccentric parts and roller pistons (col. 5 ll. 33-51); a first cam bush that causes an eccentric rotation of the first roller piston to perform the compression stroke in the first compression chamber (col. 5 ll. 33-43); and a capacity ratio of the rotary compressor that is settable based on the opening ratios of the first and second sub-paths (col. 8 ll. 27-34).

5. Claims 1, 11, 20, 23, 27, and 31-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Cho et al. US 2004/0071560.

The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131. Cho et al. discloses all the limitations as substantially claimed including a rotary compressor, comprising: a rotating shaft 301 having first 301a and second 301b eccentric parts; a reversible motor 30 to rotate the rotating shaft in either a first or a second rotating direction, first 307a and second 307b cylinders comprising a first 308a and second 308b compression chamber in which a refrigerant compression stroke or an idle stroke is performed in accordance with the first or/and second rotating direction of the eccentric parts of the rotating shaft (claim 1), first and second intake ports to suck a refrigerant into the first compression chamber, first and second exhaust ports to discharge the refrigerant from respective compression chambers after the refrigerant is compressed (claim 2), such that first and second compression chambers alternately perform the compression stroke and the idle

stroke (pg. 2 paragraph 0013), a first sub-path 503a and 503b which allows a predetermined point 501 of the first compression chamber to communicate with the first intake port so as to control a compression capacity of the first compression chamber, and a path control unit to control an opening ratio of the first sub-path and constituting a compression chamber capacity control (pg. 4 paragraph 0051); first 305a and second 305b roller pistons fitting over the first 301a and second 301b eccentric parts of the rotating shaft in respective compression chambers, wherein there is a gap being eccentric in shape and defined between the roller pistons and respective eccentric parts, first 306a and second 306b cam bushes having an eccentric shape and fitting in the first eccentric gap between the first eccentric part and the first roller piston in the first compression chamber; and plural compression chambers in which a refrigerant compression stroke and an idle stroke are performed in accordance with a first rotating direction or second rotating direction of the rotating shaft, and one or more sub-paths connectable to the plural compression chambers to vary a refrigerant compression capacity thereof to set a total capacity of the rotary compressor between at least four stages based on a direction of a rotation of the rotating shaft and a connection status of each of the one or more sub-paths (claims 51-52).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-10, 29, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebara in view of Robbins et al. 6,190,137. Ebara teaches all the claimed limitations as discussed above in addition to first 29 and second 19 exhaust ports; predetermined points of the first and second compression chambers for communicating with the first 23 and second 24 intake ports; a first and second sub-path pipe with the areas between elements 23 and 24 and 9 and 10 respectively; first 245 and second 247 path control units which control the opening ratios of the first and second sub-paths; wherein the predetermined point of the first compression chamber is determined such that the compression capacity of the first compression chamber capable of being reduced within a range of 20% to 30%, in a state that the first sub-path is opened by the path control unit, and the compression capacity of the second compression chamber is capable of being reduced within a range of 40% to 60% in a state that the second sub-path is opened by the path control unit; however Ebara fails to teach the claimed limitation of a reversible motor 30, as taught by Robbins. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the motor of Robbins to the rotary compressor of Ebara to allow for rotating the shaft of Ebara in either a first rotating direction or a second rotating direction (Robbins col. 3 ll. 33-43) and control the

variable displacement of a rotary compressor by controlling the direction of rotation of the motor (Robbins col. 1 ll. 22-26).

9. Claims 22 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebara in view of Robbins as discussed and applied to claims 11 and 23. Ebara teaches all the claimed limitations as discussed including a second cam bush performing an idle stroke in the second compression chamber when a shaft is rotating in a first direction by a motor, but fails to teach the limitations taught by Robbins including: a concentric rotation of a first piston 58 performing an idle stroke in the first compression chamber 80 and eccentric rotation of a second piston 56, performing the compression stroke, in the second compression chamber 78, caused by first 92 and second, 114 of 112, cam bushes respectively, when said motor 30 is rotated in a second direction (Robbins col. 5 ll. 59-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the cam assembly of Robbins to the shaft of Ebara to allow for a rolling piston to perform a concentric rotation within a first compression chamber (Robbins - col. 5 ll. 59-67), and thereby reducing the overall displacement of the compressor by half (Robbins – col. ll. 31-34), maximizing the efficiency of the compressor, and reducing energy consumption (Ebara col. 1 ll. 41-52).

10. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebara in view of Robbins. Ebara teaches all the limitations of the rotary compressor as discussed above, and the claimed limitations of a method comprising successive stages (Ebara - M1, M2, M3, M4) in which the overall displacement of the compressor is varied by varying the displacement within the separate compression chambers by opening and closing sub paths controlled by a control unit (Ebara col. 10 ll. 56-67, col. 11 ll. 8-12 and 57-61, and col. 12 ll. 15-19), with the exception of the claimed limitations taught by Robbins including: wherein the rotation and alternating

direction of rotation of a shaft driven by a reversible motor causes multiple rolling pistons to rotate concentrically and eccentrically about the shaft while performing idle and compression strokes within respective compression chambers (Robbins col. 6 ll. 13-34), and the method of varying the displacement by greater than or less than 50% at different stages (Robbins col. 6 ll. 30-44). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the cam assembly and motor of Robbins to the rotary compressor of Ebara to operate the compressor with minimal power consumption, noise, and risk of damage due to normal operation (Robbins col. 6 ll. 45-59 and Ebara col. 2 ll. 7-14).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is cited on form 892 herewith.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard J. Weinstein whose telephone number is 571-272-9961. The examiner can normally be reached on Monday - Thursday 7:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg can be reached on 571-272-4828. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LJW

12/13/06

EHUD GARTENBERG
SUPERVISORY PATENT EXAMINER